



THE CITY OF SAN DIEGO **MANAGER'S REPORT**

DATE ISSUED: May 30, 2001 REPORT NO. 01-109

ATTENTION: Honorable Mayor and City Council
Docket of June 5, 2001

SUBJECT: Community Concourse Energy Savings Measures

SUMMARY

Issues - 1) Should the Mayor and City Council authorize the City Manager to enter into an amendment to the Master Energy Efficiency Service Agreement with Onsite Energy Corporation (Onsite) to implement energy savings measures for the Community Concourse, based primarily on replacing the chillers and surrounding equipment?

2) Should the Mayor and City Council authorize the City Manager to accept a grant of \$600,000 from San Diego Gas & Electric Company to partially offset the cost of implementing the energy saving measures?

Manager's Recommendation - Approve both agreements.

Other Recommendations - None.

Fiscal Impact - The cost to the City of the proposed improvements will not exceed \$3,196,670 (including financing costs), less grant funds totaling \$715,000. This project is proposed to be financed and paid back solely through energy savings, thereby fully amortizing the project costs over 7 years. Once these costs are amortized, the efficiency measures will result in estimated net energy savings of more than \$300,000 per year.

BACKGROUND

The Central Power plant provides chilled and hot water for both domestic consumption and environmental space conditioning for the City Administration Building, the Development Review Center, the Convention and Performing Arts Center, and the Civic Theater. The chiller plant consists of three Carrier Model 19-C units, along with associated valves, pumps, motors

and piping, all of original 1964 vintage. The central plant is operated and maintained by the Convention Center Corporation, and the costs are shared between the City and the Convention Center pursuant to a 1998 contract.

As part of the Civic Center Master Plan study, the City retained LSW Engineers to perform an independent assessment of the Central Power plant. LSW concluded that the plant is in fairly good condition for its age. However, the existing chillers have exceeded the projected useful life remaining. Industry standards identify 23 years as the median useful life, and the existing chillers have been in service 36 years. Even though preventive maintenance procedures are regularly performed, LSW concluded that a major operational failure is likely to occur within the next seven years. In addition, the chillers use R-11 refrigerant which has limited availability.

Condenser water for the chillers is provided by a wood frame cooling tower located on the roof over Golden Hall. It also was installed in 1964 and is in poor condition. According to industry standards the median useful life of a wood frame cooling tower is approximately 20 years.

In November, 2000, the Committee on Rules, Finance and Intergovernmental Relations reviewed this issue and recommended that the City enter into an agreement with NRG Energy Center San Diego (NRG) to provide chilled water in lieu of continuing to use the existing chillers. The principal concern their action addressed at that time was to avoid a significant investment in the City Administration Building/Community Concourse inasmuch as the life of the City complex has been an ongoing issue.

DISCUSSION

The chillers are the subject of discussion for two primary reasons:

- 1) The existing chillers have been in service for 36 years and equipment failure without adequate backup is a concern. With the successes of the Convention Center Corporation in more fully utilizing the Community Concourse facilities for convention business, chiller failure would negatively impact the City's convention business.
- 2) The second issue is the inefficiency of energy use by the central plant. In each of the past three fiscal years, the City's energy cost to operate the Community Concourse facilities has exceeded \$1.1 million. Of this amount, an estimated \$136,000 per year was the cost of electricity to generate chilled water at the central plant. Through research with industry sources, LSW forecast that the average cost per kilowatt hour would increase approximately twenty-five per cent in Fiscal Year 2001 over the average cost during Fiscal Year 2000 and increase between three and nineteen percent over the next five years. In fact, since LSW's report, the cost of electricity has maintained a level two to three times higher than the previous year. Because of the currently volatile energy market, it is imperative to implement all feasible energy savings measures to limit these increased costs. The proposed amendment to the Onsite agreement is consistent with the recent policy direction by the Mayor and Council to develop energy conservation projects (R-2001-525).

In 1999, the City entered into the original agreement with Onsite which covered four City facilities: the Crabtree Building, the World Trade Center, Pump Station No. 2, and the Central Library. An assessment of each facility was performed and a scope of work established to identify all feasible energy savings upgrades and improvements. Onsite then performed this work, the cost of which was financed at a very favorable rate (6.29%) to be paid back through energy savings. The amortization periods vary slightly for each facility, but once the costs are amortized, the City continues to receive the benefit of the energy savings. In preparing their response to the Request for Proposals, Onsite and the other respondents used the Community Concourse central plant as the example for their analysis. As a result, staff has a good understanding of what energy savings improvements could be accomplished. This would include replacement of existing chillers and cooling tower with modern, more efficient equipment; reconfiguration of the hot/cold air handling system; replacement of pumps, fan motors and air handler drives with variable speed devices; replacement of the existing steam boiler with hot water heaters and domestic hot water heat exchangers; completion of the lighting upgrade and replacement of the existing building control system with a state-of-the-art, digital energy management and control system.

On March 19, 2001, subsequent to the action by the Rules, Finance and Intergovernmental Relations Committee, City staff responded to a Request for Proposals for Nonresidential Peak Load Reduction issued by San Diego Gas & Electric to do the work described above. As a result of that effort, the City was awarded \$600,000 to offset the cost of implementing the proposed energy efficiency measures at the Community Concourse. Also, through the Standard Performance Contract program authorized by the California Public Utilities Commission and administered by SDG&E, additional incentive money of approximately \$115,000 is available to further encourage the implementation of energy efficiency measures.

The attachments to this report compare the costs associated with replacing the chillers, utilizing the grant from SDG&E, to the proposal from NRG. Under the proposal from NRG, they would provide the City with chilled water, generated offsite and distributed to the Community Concourse via a "district cooling" network. Under NRG's proposal the existing chillers would be decommissioned, but remain in place as an emergency backup. However, the existing distribution pumps and control valves would still need to be upgraded to make district cooling more efficient and provide better air conditioning throughout the Concourse facility. The annual contract cost of the NRG proposal is estimated to be \$338,000 in the first year of a seven-year agreement. Costs in subsequent years would increase at a rate commensurate with CPI and the cost of energy. It is also estimated that modifications and upgrades of the current Central Power plant and CAB air handling system of approximately \$314,000 would be required to allow the existing facility to make optimum use of imported chilled water.

At staff's request, LSW Engineers performed an independent analysis of NRG's proposal and estimated that, in addition to the cost of chilled water, the City would incur additional costs of approximately \$34,000 per year for staffing, pumping electricity and miscellaneous repairs. In addition, should the City choose to exercise its right to cancel the contract upon six months' notice, the proposal would require payment of a termination fee of up to \$250,000.

LSW initially determined that within a seven-year threshold, the NRG proposal was a reasonable, short-term solution to the City's need for a reliable source of chilled water at the Concourse. And on November 20, 2000, the Rules, Finance and Intergovernmental Relations Committee voted to authorize the City Manager to enter into agreements with both Onsite, to perform energy efficiency measures except chiller replacement, and with NRG, to supply the City's need for chilled water. However, the additional incentive money available from SDG&E makes the replacement of the existing chillers and their operation by current staff a more financially viable option, even for the short term. City staff met with representatives from NRG on April 20, 2001 to discuss this change in circumstances.

The final analysis which was conducted compared the recommended replacement with doing nothing at this time; assuming that the chillers have operated for 36 years, they would continue to operate until the Concourse Complex is replaced. In addition to this option being more expensive than the recommended alternative due to inefficient energy usage, it doesn't include the cost of repair, if needed, or the lost revenue due to equipment failure without back up equipment.

OTHER ALTERNATIVE

Do not authorize execution of either of the agreements. This is not recommended due to the lost energy savings that would result.

Respectfully Submitted,

Ernie Anderson
General Services Director

Approved: George Loveland
Senior Deputy City Manager

ANDERSON/DMS

Attachments

1. 7-year Life Cost Analysis for CAB Chiller and Energy Efficiency Retrofit
2. 7-year Life Cost Analysis for District Cooling Purchase
3. 7-year Projection of Central Power Plant Operation Costs
4. Statement of Engineered/Guaranteed Savings
5. Operational Cost Savings Which Result from Implementation of Energy Efficiency Measures